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sey's Runs; *Rhinichthys atronasmus*, Ramsey's and Marsh Runs; *Hybopsis kentuckiensis*, *Catostomus commersonnii*, Ramsey's and Cherry Runs; *C. nigricans*, *Moxostoma aureolum*, Cherry Run; *Ameiurus nebulosus*, *Noturus flavus*, *Ambloplites rupestris*, Ramsey's Run; *Hadropterus macrocephalus*, *Boleosoma nigrum*, Cherry and Marsh Runs; *Etheostoma flabellare*, Marsh Run; *Cottus gracilis*, Ramsey's Run.

On July 23, 1899, I secured an example of *Leuciscus margarita* in a tributary of the Alleghany River near Cole Grove, McKean County, the first I know of from that basin.

On July 1, 1907, Mr. T. D. Keim and myself took two examples of *Notropis boops* Gilbert from the Alleghany just above Foxburg, in Clarion County, also the first from that river.

I may note that *Coccogenia* Cockerell and Callaway, *Proc. Biol. Soc. Wash.*, XXII., 1909, p. 190, is an exact synonym of *Coccotis* Jordan, *Rep. Geol. Surv. Ohio*, IV., 1882, p. 852, type *Hypsilepis coccogenis* Cope, monotypic.

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SCIENTIFIC BOOKS

Die Geographische Verbreitung der Schmetterlinge. Dr. ARNOLD PAGENSTECHER. Mit zwei Karten. 8vo, pp. ix + 451. Verlag von Gustav Fischer in Jena. 1909.

Geheimrat Dr. Arnold Pagenstecher has long been favorably known to students of oriental lepidoptera as the author of a number of faunal and monographic papers of the highest merit. His investigations, which have chiefly related to the Malay Archipelago, inevitably led him to the consideration of questions of geographical distribution, and as the result of comprehensive studies we have before us the present volume.

The work divides itself into three sections.

The first section, occupying fifty-nine pages, deals with the underlying causes of the geographical distribution of the lepidoptera. Soil, temperature, humidity, air-currents and vegetation are discussed with relation to the

distribution of the forms of lepidopterous life. The distribution of the lepidoptera at various elevations above sea-level is considered. The migrations of butterflies, the cosmopolitan character of some species, seasonal dimorphism and local variation are touched upon. Several pages are devoted to the consideration of the influence of the glacial epoch and the various mutations which the surface of the earth has undergone in past geological ages. The influence of parasitic life upon the distribution of species concludes this portion of the work.

The second portion of the work, which occupies the body of the book, extending from page 62 to page 401, is devoted to a statement of the results which have thus far been reached by students of the lepidoptera who have written upon the faunæ of the various continents and islands. The various published lists of species are cited and briefly analyzed, and there is thus supplied a very valuable guide to the literature of the whole subject. This portion of the work displays enormous industry on the part of the author and a very thorough familiarity with what has been written. Dr. Pagenstecher recognizes eight faunal regions, and the distribution which he accepts may be given in tabular form as follows:

I. NORTH-POLAR REGION.

(The entire circumpolar northern arctic territory.)

II. PALÆARCTIC (EUROPEO-SIBERIAN) REGION.

Subregions.

1. *European*.

2. *Mediterranean*.

Including the Azores, Madeira, the Canaries and Cape Verde Islands; northern Africa, Asia Minor and Syria, as well as all parts of Europe bordering on the northern shores of the Mediterranean.

3. *Siberian*.

4. *Manchurian*.

Including Japan.

III. INDIAN REGION.

1. *India* to the Himalayan foot-hills.

2. *Ceylonese*.

Ceylon and the Maldives and Laccadives.

3. *Indo-Chinese.*

Southeastern Asia, including Hainan, Formosa and the Loochoo Islands.

4. *Malayan.*

Including Malacca and the islands north and west of a line drawn between Bali and Lombok, north and east between Borneo and the Philippines on the west and Celebes on the east (Wallace's Line).

IV. AUSTRALIAN REGION.

*Subregions.*1. *Austromalayan.*

All the islands east and south of Wallace's Line, including New Guinea, except as hereinafter mentioned.

2. *Australian.*

Australia and Tasmania.

3. *Polynesian.*

New Caledonia, the New Hebrides and the various archipelagoes northward and eastward as far as the Sandwich Islands.

4. *New Zealand.*

New Zealand and the Norfolk, Lord Howe, Auckland and Chatham Islands.

V. THE ETHIOPIAN REGION.

(Africa south of the Mediterranean states, the Sudan, Madagascar and the nearer islands.)

*Subregions.*1. *West African.*

Tropical West Africa, including St. Helena, Ascension and islands nearer the mainland.

2. *South African.*

(Temperate South Africa.)

3. *East African.*

Portuguese, German and British East Africa, the Sudan, Somaliland, Abyssinia, Aden and southern Arabia.

4. *Malagassy.*

Including Madagascar and the surrounding islands.

VI. NORTH AMERICAN (NEARCTIC) REGION.

Including the entire continent north of Mexico and south of the Arctic or North Circumpolar Region.

VII. SOUTH AMERICAN (NEOTROPICAL) REGION.

*Subregions.*1. *Chilean.*

Including Tierra del Fuego, Patagonia, Argentina, Chile, the Falkland, Juan Fernandez and Easter Islands.

2. *Brazilian.*

Covering all the continent north and east of the Chilean subregion, and including the Galapagos Islands and Trinidad.

3. *The Central American and Mexican.*4. *West Indian.*

The Greater and Lesser Antilles.

VIII. ANTARCTIC REGION.

Kerguelen Islands.

A consideration of the foregoing arrangement shows that in a general way it accords with the known facts of distribution, but nevertheless is open to some objection, more particularly as it does not take account of the fact that many of the regions mapped out are invaded at various points by faunæ which persist at great elevations on the mountain-tops, or by faunæ extending through low-lying semi-tropical areas into more temperate regions. It is well known to students of the geographical distribution of the lepidoptera that the Sonoran fauna of the western portions of North America extends far south into the Central American subregion, and that even the Canadian fauna is represented upon the summits of the highest mountains not only of Central America, but of South America. The Chilean subregion is closely related in many respects to the North American fauna, and we have reason to believe that the genera which are found in the Argentine Republic and are also found in North America, owe their distribution throughout the entire length of the Cordilleran ranges and the temperate regions of South America and North America to a common center of original distribution. The southern extremity of Florida contains a lepidopterous fauna which is strictly West Indian. Similar phenomena present themselves to view in other parts of the world. It is no doubt difficult to adopt any general arrangement which will take account of these facts, and it may perhaps be asking too much to insist that in a work,

which like the present is intended to give a general view of the subject, these details should be emphasized. Upon the whole the arrangement of faunal regions accords well with what has been ascertained by the latest investigations.

The third portion of the book gives an account of the geographical distribution of the various families and genera of the lepidoptera in different parts of the world. Forty-six pages are devoted to this section. This part of the work is in the main satisfactory and as complete as could be expected within the limits of space assigned to the subject by the author.

It is of course impossible to expect that in a work of this magnitude errors should not creep in. Some of those which exist are, however, scarcely pardonable. On p. 4 we are informed that "In North America the entire center of the land between the Rocky Mountains and the Allegheny ranges is occupied by a desert extending southward over a large part of New Mexico, Texas, and northern Mexico." It is rather amazing at this late date to find the mythical "Great American Desert," which occupied a space upon the maps published at the beginning of the last century revived, and to have it even extended eastward as far as the Allegheny ranges through a now populous territory filled with large towns and cities, and abounding in agricultural resources. On page 6 the genus *Teracolus* is stated to occur in North America, as well as in the arid coast regions of northwestern and eastern Africa. This is a singular error. The genus is strictly confined to the old world, and not a single species occurs in the western hemisphere. In many places the work gives evidence of careless proof-reading, as on page 67, where "Ireland" is substituted for "Island," thereby confusing the meaning; on page 315, where the word "Totenmeeres" is substituted for "Rotenmeeres," the Dead Sea being substituted for the Red Sea. Generic and specific names in a multitude of cases are misspelled. On page 317, near the foot of the page, where reference is made to a paper by the present reviewer upon the *Hesperidae* of Africa, eight generic names are cited, of which five are mis-

spelled. Minor defects of this sort, while not detracting from the general value of the work, ought in a future edition to be rigidly excluded.

Upon the whole it may be said that this is the most comprehensive and satisfactory work upon the geographical distribution of the lepidoptera of the world which has up to the present time been written. While not free from defects, as has been suggested, it is a work which must prove itself of great value to all students of the lepidoptera, and it reflects great credit upon the learning and industry of its distinguished author.

W. J. HOLLAND

QUOTATIONS

THE LENGTH OF SERVICE PENSIONS OF THE CARNEGIE FOUNDATION

THE ethical question involved in the change, however, stands on quite a different basis. We do not find that anything in the report breaks the force of the criticisms made in the letters that have appeared in the *Evening Post*, one from Professor Lovejoy, of the University of Missouri, the other from Professor Weeks, of Columbia University. Nothing could be clearer or more unqualified than the statement in the original rule that professors of twenty-five years' service were "entitled" to the pensions. There is no telling in what degree the plans of professors and of colleges, for the past four years, have been based on the well-grounded expectation that this promise would be carried out. It is true that the foundation gave notice that its rules might be modified "in such manner as experience may indicate as desirable"; nobody can charge it with breach of contract. But to abolish completely, at a stroke, without notice, one of the cardinal features of the system is not the sort of thing that anybody had the slightest reason to anticipate.

Dr. Pritchett says that "the expectation that this rule would be taken advantage of almost wholly on the ground of disabilities has proved to be ill-founded"; but if this is meant as a defense against the charge of want of good faith, it betrays a misty notion of the nature of moral obligations. If disability was